

Application No. 10/510,586
Amendment Dated February 16, 2006
Reply to Office Action of November 16, 2005

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-4 (Cancelled)

Claim 5 (New) A method of detecting a leak in reciprocating machinery, the machinery comprising at least two pistons that are driven by the machinery in reciprocating motion to produce a flow of material, the method comprising the steps of:

identifying a fundamental frequency of the machinery, the fundamental frequency comprising the rotational frequency of the machinery multiplied by the number of pistons in the machinery;

monitoring the flow out of the machinery; and

detecting a leak in the machinery by identifying a flow component of the monitored flow that has different frequency than the fundamental frequency of the machinery.

Claim 6 (New) The method of claim 5, wherein the flow is monitored by means of Fourier analysis.

Claim 7 (New) The method of claim 5, further comprising the steps of:

measuring an angular position of a crankshaft on the machinery, and

localizing the detected leak based upon a comparison of the frequency of the flow component and the crankshaft angle.

Claim 8 (New) The method of claim 5, further comprising the steps of:

measuring an angular position of a cam on the machinery, and

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localizing the detected leak based upon a comparison of the frequency of the flow component and the cam angle.

Claim 9 (New) An arrangement for detecting a leak in reciprocating machinery that has at least two pistons that reciprocate to produce a flow, the arrangement having a fundamental frequency constituted by the rotational frequency of the reciprocating machinery multiplied by the number of pistons in the machinery, the arrangement comprising:

at least one measuring device arranged to measure a flow value from the machinery; and

a computer arranged to receive the flow value from the measuring device;

wherein the computer comprises a program that detects leaks in the machinery by identifying a flow component of the flow valve that has a frequency that differs from the fundamental frequency of the machinery.

Claim 10 (New) The arrangement of claim 9, wherein the machinery comprises a crankshaft driving the pistons and further comprising a rotational angle transmitter coupled to the computer, the transmitter arranged to measure an angle of the crankshaft.

Claim 11 (New) The arrangement of claim 10, wherein the computer program is arranged to localize the leak associated with the identified flow component by analyzing the relationship between the frequency of the flow component and the crankshaft angle.

Claim 12 (New) The arrangement of claim 9, wherein the machinery comprises a cam driving the pistons and further comprising a rotational angle transmitter coupled to the computer, the transmitter arranged to measure an angle of the cam.

Claim 13 (New) The arrangement of claim 9, wherein the machinery comprises a pump.